FORM PTO-1390 (Modified) (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR
112740-221	09/856841

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE99/03633	15 November 1999	25 November 1998

TITLE OF INVENTION
IDSN NETWORK WITH A HARDWARE PLATFORM IN SWITCHING CENTERS

APPLICANT(S) FOR DO/EO/US
Christian Maierhofer

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
9. ☒ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☒ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Submission of Drawings - Figures1-2 on two sheets

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/856841	PCT/DE99/03633	112740-221

21. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO	$1,000.00
☒	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO	$860.00
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	$710.00
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)	$690.00
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)	$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	$0.00	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	4 - 20 =	0	x $18.00	$0.00	
Independent claims	1 - 3 =	0	x $80.00	$0.00	
Multiple Dependent Claims **(check if applicable).**			☐	$0.00	
TOTAL OF ABOVE CALCULATIONS =				$860.00	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).** ☐				$0.00	
SUBTOTAL =				$860.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +				$0.00	
TOTAL NATIONAL FEE =				$860.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).** ☐				$0.00	
TOTAL FEES ENCLOSED =				$860.00	
				Amount to be: refunded	$
				charged	$

☒ A check in the amount of **$860.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. in the amount of to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **02-1818** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

William E. Vaughan (Reg. No. 39,056))
Bell, Boyd & Lloyd LLC
P.O. Box 1135
Chicago, Illinois 60690

SIGNATURE

William E. Vaughan
NAME

39, 056
REGISTRATION NUMBER

May 25, 2001
DATE

BOX PCT

IN THE UNITED STATES ELECTED/DESIGNATED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

PRELIMINARY AMENDMENT

APPLICANT:	Christian Maierhofer	DOCKET NO: 112740-221
SERIAL NO:		GROUP ART UNIT:
		EXAMINER:
INTERNATIONAL APPLICATION NO:		PCT/DE99/03633
INTERNATIONAL FILING DATE:		15 November 1999
INVENTION:	ISDN NETWORK WITH A HARDWARE PLATFORM IN SWITCHING CENTERS	

Assistant Commissioner for Patents,
Washington, D.C. 20231

Sir:

Please amend the above-identified International Application before entry into the National stage before the U.S. Patent and Trademark Office under 35 U.S.C. §371 as follows:

In the Specification:

Please replace the Specification of the present application, including the Abstract, with the following Substitute Specification:

SPECIFICATION

TITLE

ISDN NETWORK WITH A HARDWARE PLATFORM IN SWITCHING CENTERS

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an ISDN network with switching centers to which data-compatible terminals, e.g. in the form of computers with ISDN cards, are

also connected, wherein the switching centers include a switching network and a coordination processor with user programs, and the network is configured to allow an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs.

Description of the Prior Art

Operator systems providing information and/or switching services are typical examples of data exchange between a data-compatible terminal and a digital switching center, where network-wide data connections are to be established between the terminals of operator-console systems and the digital controller of a digital exchange.

According to known proposals, a data connection is established over the ISDN D channel in order to transfer internal data, though network-wide transfer via the network is not possible between port-based user programs. However, the small data volume that can be transferred per time unit, which is theoretically 16 kbit/s for an ISDN D channel (though this transfer rate is only partially achieved), has an adverse effect in practice, since the D channel is also used for ISDN signaling. As a result, it cannot be used for relatively large data volumes, such as, for example, in the case of software updates requiring several Mbytes.

WO 98/17079 (Siemens Aktiengesellschaft) describes a method for handling service connections in a digital network, which enables a subscriber with a digital terminal to access the Internet via the fastest possible path. A suitable switching center contains what is known as a "POP" server, to which a line trunk group is assigned, and where the POP server is a hardware platform.

However, the present application concerns a switching center that includes a coordination processor with user programs that relate to operator consoles, for example, where large data volumes may occur.

SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to a way by which relatively large data volumes can be transferred over data connections between data-compatible terminals and the software of the coordination processor in a switching center, with

facilities for sending large data volumes automatically; e.g., at times of low network utilization.

Based on an ISDN network of the type described at the beginning, the present invention achieves this by installing a hardware platform in at least one switching center, the hardware platform being assigned a unique call number throughout the network, and a direct bus connection being provided between this hardware platform and the coordination processor. The platform implements the data traffic with the terminals via B channels and the coordination processor is configured in conjunction with a user program to dial up terminals directly via a subscriber call number.

Using the present invention, a data-compatible terminal can dial up the hardware platform directly, so that data from the user programs can be sent to the terminals via the direct bus connection. Since the data traffic now flows via B channels of the ISDN network, it is possible to transfer considerably greater data volumes, i.e. up to 64 kbit/s and, if necessary, the intelligent digital switching center can also establish a data connection with a data-compatible terminal.

For transferring relatively large data volumes, it is also expedient to configure the hardware platform to support data traffic with a terminal via both B channels.

For security reasons, it is also possible to assign the hardware platform a call number that cannot be dialed.

Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Preferred Embodiments and the Drawings.

DESCRIPTION OF THE DRAWINGS

Figure 1 shows the schematic layout of a switching center with a connected terminal and a state-of-the-art operator console; and

Figure 2 schematically shows an ISDN network of the present invention with two switching centers, together with connected terminals or operator consoles.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to Figure 1, a local switching center LVS has a coordination processor COP, a switching network KNE, and an access unit ASE. A data-compatible

terminal EGE may consist of a PC with an ISDN card ISC, for example, and this PC has access to user programs UPR. Using an ISDN basic access IBA, data can be transferred with the switching center LVS over the ISDN D channel. As described in, for example "ISDN - Digitale Netze für Sprachen, Text, Daten, Video und Multimedia-Kommunikation" [ISDN - digital networks for voice, text, data, video and multimedia communication] by Peter Bocker, 4th edition, Springer Verlag 1997, ISBN 3-45-57431-X, each basic access gives a user two 64-kbit/s basic channels, known as B channels, and one 16-kbit/s auxiliary channel, known as the D channel, in each direction. The data stream from a number of ISDN basic accesses, up to approximately 500 in practice, is concentrated in the access units ASE onto a message channel with 64 kbit/s leading to the coordination processor COP, and the data are routed to the individual user programs UPR1, UPR2 and UPR3 from there. Such user programs may be implemented to manage or support a switching operation, for example, where an operator console OPP is provided, such as for manual switching. The switching center LVS shown in Figure 1 is a local switching center, and provides the only data connection available to the terminal EGE. No network-wide data connections are therefore possible, in addition to which the data transfer is restricted to 16 kbit/s per terminal. Furthermore, the combination of several ISDN basic accesses on one internal message channel of the switching center LVS creates an undesirable bottleneck.

By contrast, as shown in Figure 2, the present invention proposes a hardware platform HWP in a switching center LVSR, in addition to the coordination processor COP with the user programs UPR1, UPR2 and UPR3, and a switching network KNE which hardware platform HWP is connected directly to the ports of the line trunk group LTG on one side, and via a direct bus connection BUV to the coordination processor (COP) and its user programs UPR1, UPR2 and UPR3 on the other side. It should be noted that, in principle, a switching center LVSR can be implemented as what is known as an EWSD (Siemens digital electronic switching system), as described in, for example, "Telekommunikationstechnik" [Telecommunications systems] by Ottfried Georg, in Chapter 7.3 of "Das Vermittlungssystem EWSD" [the EWSD switching system], Springer Verlag 1996, ISBN 3-45-61381-1.

As is evident, the actual ISDN network NET also includes other switching centers, such as the switching center LVSr shown on the left of the diagram with a switching network KNE and other equipment not shown here, to which a further terminal EGEr is, in turn, connected via an ISDN basic access IBA, and where this terminal likewise includes an ISDN card ISC and user programs UPR.

During operation, the ISDN card ISC of a terminal EGE, for example, initiates an outgoing call over the B channel to the hardware platform, where it is expedient to use a "non-dialable" number for this purpose, e.g., "0F10". "Non-dialable" refers to the number not being able to be dialed using a conventional keypad, which only has numbers, and is expedient for security reasons. The remote switching center, namely the switching center LVSr on the left of the diagram in this case, analyzes the dialed number and routes the call through the public exchange to the destination switching center LVSR where the digits in the call number are analyzed, and traffic for the internal hardware platform HWP is identified. The next step is to find a free port for access to the hardware platform HWP, this being performed by the routing functions of the switching center LVSR.

As mentioned previously, the ports assigned to the hardware platform HWP are connected within the switching center to the line trunk group LTG for outgoing lines or subscribers. The hardware platform HWP now handles the data transfer protocol with the terminals, and the hardware platform HWP transfers data to the user programs UPR1, UPR2 and UPR3 in the coordination processor COP. Furthermore, the hardware platform HWP accepts data from the user programs and sends them to the terminals EGEr. In this context, the hardware platform HWP is directly connected to the central controller, namely the coordination processor COP, via the bus connection BUV, and uses interprocessor messages to communicate with the user programs. The user programs UPR1, UPR2 and UPR3 in the coordination processor COP receive the data from the hardware platform HWP. If a user program wants to send data back to the terminal EGEr, it uses an interprocessor message to transfer them to the hardware platform, which can dial up terminals directly via a subscriber call number. It is also

expedient for the hardware platform HWP to be configured to support data traffic with a terminal via both B channels, in order to allow higher data throughput.

Although the present invention has been described with reference to specific embodiments, those of skill in the art will recognize that changes may be made thereto without departing from the spirit and scope of the invention as set forth in the hereafter appended claims.

ABSTRACT OF THE DISCLOSURE

An ISDN network with switching centers, to which data-compatible terminals, e.g. in the form of computers with ISDN cards, are also connected, wherein the switching centers include a switching network and a coordination processor with user programs, and wherein the network is configured to allow an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs, and wherein, a hardware platform is installed in at least one switching center and is assigned a unique call number throughout the network, and a direct bus connection is provided between this hardware platform and the coordination processor, where the platform implements the data traffic with the terminals via B channels.

In the claims:

On page 6, cancel line 1, and substitute the following left-hand justified heading therefor:

I Claim as My Invention:

Please cancel claims 1-4, without prejudice, and substitute the following claims therefor:

6. An ISDN network, comprising:

a public exchange;

a plurality of switching centers connected via the public exchange, each of the plurality of switching centers including a switching network and a coordination processor with user programs;

a plurality of data-compatible terminals formed of computers with ISDN cards, each of the plurality of data-compatible terminals being connected to one of the plurality of switching centers, such that data exchange is allowed between the plurality

of data-compatible terminals and the coordination processors as defined by the user programs;

a hardware platform installed in at least one of the plurality of switching centers, the hardware platform being assigned a unique call number throughout the ISDN network; and

a direct bus connection provided between the hardware platform and the associated coordination processor;

wherein the hardware platform implements the data exchange traffic with the plurality of data-compatible terminals via B channels, and the coordination processors are configured in conjunction with the user programs to dial up the plurality of data-compatible terminals directly via a subscriber call number.

7. An ISDN network as claimed in claim 6, wherein the hardware platform is configured to support the data traffic with one of the plurality of data-compatible terminals via two B channels.

8. An ISDN network as claimed in claim 6, wherein the unique call number assigned to the hardware platform is a non-diallable call number.

9. An ISDN network as claimed in claim 6, wherein the hardware platform is directly connected to ports of a line trunk group.

REMARKS

The present amendment makes editorial changes and corrects typographical errors in the specification, which includes the Abstract, in order to conform the specification to the requirements of United States Patent Practice. No new matter is added thereby. Attached hereto is a marked-up version of the changes made to the specification by the present amendment. The attached page is captioned "**Version With Markings To Show Changes Made**".

In addition, the present amendment cancels original claims 1-4 in favor of new claims 6-9. Claims 6-9 have been presented solely because the revisions by

red-lining and underlining which would have been necessary in claims 1-4 in order to present those claims in accordance with preferred United States Patent Practice would have been too extensive, and thus would have been too burdensome. The present amendment is intended for clarification purposes only and not for substantial reasons related to patentability pursuant to 35 USC §§103, 102, 103 or 112. Indeed, the cancellation of claims 1-4 does not constitute an intent on the part of the Applicant to surrender any of the subject matter of claims 1-4.

Early consideration on the merits is respectfully requested.

Respectfully submitted,

_________________________ (Reg. No. 39,056)

William E. Vaughan
Bell, Boyd & Lloyd LLC
P.O. Box 1135
Chicago, Illinois 60690-1135
(312) 807-4292
Attorneys for Applicants

Description

Method for handling service connections in a communication network

The invention relates to an ISDN network with switching centers to which data-compatible terminals, e.g. in the form of computers with ISDN cards, are also connected, wherein the switching centers include a switching network and a coordination processor with user programs, and the network is configured to allow a exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs.

Operator systems providing information and/or switching services are typical examples of data exchange between a data-compatible terminal and a digital switching center, where network-wide data connections are to be established between the terminals of operator-console systems and the digital controller of a digital exchange.

According to known proposals, a data connection is established over the ISDN D channel in order to transfer internal data, though network-wide transfer via the network is not possible between port-based user programs. However, the small data volume that can be transferred per time unit, which is theoretically 16 kbit/s for an ISDN D channel (though this transfer rate is only partially achieved), has an adverse effect in practice, since the D channel is also used for ISDN signaling, as a result of which it cannot be used for relatively large data volumes, such as occur for example in the case of software updates requiring several Mbytes.

WO 98/17079 (Siemens Aktiengesellschaft) describes a method for handling service connections in a digital network, which enables a subscriber with a digital

terminal to access the Internet via the fastest possible path. A suitable switching center contains what is known as a "POP" server, to which a line trunk group is assigned, and where the POP server is a hardware platform.

However, the present application concerns a switching center that includes a coordination processor with user programs that relate to operator consoles, for example, where large data volumes may occur.

The object of the invention is to specify a means by which relatively large data volumes can be transferred over data connections between data-compatible terminals and the software of the coordination processor in a switching center, with facilities for sending large data volumes automatically, e.g. at times of low network utilization.

Based on an ISDN network of the type described at the beginning, the invention achieves this object by installing a hardware platform in at least one switching center, said hardware platform being assigned a unique call number throughout the network, and a direct bus connection being provided between this hardware platform and the coordination processor, the platform implementing the data traffic with the terminals via B channels and the coordination processor being configured in conjunction with a user program to dial up terminals directly via a subscriber call number.

Using the invention, a data-compatible terminal can dial up the hardware platform directly, so that data from the user programs can be sent to the terminals via the direct bus connection. Since the data traffic now flows via B channels of the ISDN network, it is possible to transfer considerably greater data

volumes, i.e. up to 64 kbit/s and, if necessary, the intelligent digital switching center can also establish a data connection with a data-compatible terminal.

For transferring relatively large data volumes, it is also expedient to configure the hardware platform to support data traffic with a terminal via both B channels.

For security reasons, it is also possible to assign the hardware platform a call number that cannot be dialed.

Patent claims

1. An ISDN network with switching centers (VST1, VST2), to which data-compatible terminals (EG1, EG2), e.g. in the form of computers with ISDN cards are also connected, wherein the switching centers include a switching network (KNE) and a coordination processor (COP) with user programs (UPR1, UPR2 and UPR3), and wherein the network is configured to allow an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs, characterized in that a hardware platform (HWP) is installed in at least one switching center (VST2) and is assigned a unique call number throughout the network, and a direct bus connection (BUV) is provided between this hardware platform and the coordination processor (COP), where the platform implements the data traffic with the terminals (EG1, EG2) via B channels, and the coordination processor (COP) is configured in conjunction with a user program (UPR1, 2, ...) to dial up terminals (EG1, EG2) directly via a subscriber call number.

2. The ISDN network as claimed in claim 1 or 2, characterized in that the hardware platform (HWP) is configured to support data traffic with a terminal (EG1, EG2) via both B channels.

3. The ISDN network as claimed in claim 1 or 2, characterized in that the call number assigned to the hardware platform (HWP) is a "non-dialable" call number.

4. The ISDN network as claimed in one of claims 1 to 3, characterized in that the hardware platform (HWP) is directly connected to the ports of a line trunk group (LTG).

VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

In The Specification:

The Specification of the present application, including the Abstract, has been amended as follows:

SPECIFICATION

TITLE

~~**Method for handling service connections in a communication network**~~

ISDN NETWORK WITH A HARDWARE PLATFORM IN SWITCHING CENTERS

BACKGROUND OF THE INVENTION

~~Description~~

Field of the Invention

The present invention relates to an ISDN network with switching centers to which data-compatible terminals, e.g. in the form of computers with ISDN cards, are also connected, wherein the switching centers include a switching network and a coordination processor with user programs, and the network is configured to allow ~~a~~ an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs.

Description of the Prior Art

Operator systems providing information and/or switching services are typical examples of data exchange between a data-compatible terminal and a digital switching center, where network-wide data connections are to be established between the terminals of operator-console systems and the digital controller of a digital exchange.

According to known proposals, a data connection is established over the ISDN D channel in order to transfer internal data, though network-wide transfer via the network is not possible between port-based user programs. However, the small data volume that can be transferred per time unit, which is theoretically 16 kbit/s for an ISDN D channel (though this transfer rate is only partially achieved), has an adverse effect in practice, since the D channel is also used for ISDN signaling~~,~~. ~~as~~ As a result,

~~of which~~ it cannot be used for relatively large data volumes, such as, ~~occur~~ for example, in the case of software updates requiring several Mbytes.

WO 98/17079 (Siemens Aktiengesellschaft) describes a method for handling service connections in a digital network, which enables a subscriber with a digital terminal to access the Internet via the fastest possible path. A suitable switching center contains what is known as a "POP" server, to which a line trunk group is assigned, and where the POP server is a hardware platform.

However, the present application concerns a switching center that includes a coordination processor with user programs that relate to operator consoles, for example, where large data volumes may occur.

SUMMARY OF THE INVENTION

~~The object of~~ Accordingly, the present invention is ~~to specify a means~~ directed to a way by which relatively large data volumes can be transferred over data connections between data-compatible terminals and the software of the coordination processor in a switching center, with facilities for sending large data volumes automatically, e.g. at times of low network utilization.

Based on an ISDN network of the type described at the beginning, the present invention achieves this ~~object~~ by installing a hardware platform in at least one switching center, ~~said~~ the hardware platform being assigned a unique call number throughout the network, and a direct bus connection being provided between this hardware platform and the coordination processor, ~~the~~ The platform ~~implementing~~ implements the data traffic with the terminals via B channels and the coordination processor ~~being~~ is configured in conjunction with a user program to dial up terminals directly via a subscriber call number.

Using the present invention, a data-compatible terminal can dial up the hardware platform directly, so that data from the user programs can be sent to the terminals via the direct bus connection. Since the data traffic now flows via B channels of the ISDN network, it is possible to transfer considerably greater data volumes, i.e. up to 64 kbit/s and, if necessary, the intelligent digital switching center can also establish a data connection with a data-compatible terminal.

For transferring relatively large data volumes, it is also expedient to configure the hardware platform to support data traffic with a terminal via both B channels.

For security reasons, it is also possible to assign the hardware platform a call number that cannot be dialed.

Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Preferred Embodiments and the Drawings.

~~The invention and other advantages are described in greater detail below in an exemplary embodiment, and with reference to the drawing, in which:~~

DESCRIPTION OF THE DRAWINGS

Figure 1 shows the schematic layout of a switching center with a connected terminal and a state-of-the-art operator console~~,~~; and

Figure 2 schematically shows an ISDN network of the present invention with two switching centers, together with connected terminals or operator consoles.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to ~~figure~~ Figure 1, a local switching center LVS has a coordination processor COP, a switching network KNE, and an access unit ASE. A data-compatible terminal EGE may consist of a PC with an ISDN card ISC, for example, and this PC has access to user programs UPR. Using an ISDN basic access IBA, data can be transferred with the switching center LVS over the ISDN D channel. As described in, for example "ISDN - Digitale Netze für Sprachen, Text, Daten, Video und Multimedia-Kommunikation" [ISDN - digital networks for voice, text, data, video and multimedia communication] by Peter Bocker, 4th edition, Springer Verlag 1997, ISBN 3-45-57431-X, each basic access gives a user two 64-kbit/s basic channels, known as B channels, and one 16-kbit/s auxiliary channel, known as the D channel, in each direction. The data stream from a number of ISDN basic ~~access~~ accesses, up to approximately 500 in practice, is concentrated in the access units ASE onto a message channel with 64 kbit/s leading to the coordination processor COP, and the data are routed to the individual user programs UPR1, UPR2 and UPR3 from there. Such user programs may be implemented to manage or support a switching operation, for

example, where an operator console OPP is provided, ~~e.g.~~ such as for manual switching. The switching center LVS shown in ~~figure~~ Figure 1 is a local switching center, and provides the only data connection available to the terminal EGE. No network-wide data connections are therefore possible, in addition to which the data transfer is restricted to 16 kbit/s per terminal. Furthermore, the combination of several ISDN basic ~~accesss~~ accesses on one internal message channel of the switching center LVS creates an undesirable bottleneck.

By contrast, as shown in ~~figure~~ Figure 2, the present invention proposes a hardware platform HWP in a switching center LVSR, in addition to the coordination processor COP with the user programs UPR1, UPR2 and UPR3, and a switching network KNE which hardware platform HWP is connected directly to the ports of the line trunk group LTG on one side, and via a direct bus connection BUV to the coordination processor (COP) and its user programs UPR1, UPR2 and UPR3 on the other side. It should be noted that, in principle, a switching center LVSR can be implemented as ~~a~~ what is known as an EWSD (Siemens digital electronic switching system), as described in, for example, "Telekommunikationstechnik" [Telecommunications systems] by Ottfried Georg, in Chapter 7.3 of "Das Vermittlungssystem EWSD" [the EWSD switching system], Springer Verlag 1996, ISBN 3-45-61381-1.

As is evident, the actual ISDN network NET also includes other switching centers, ~~e.g.~~ such as the switching center LVSr shown on the left of the diagram with a switching network KNE and other equipment not shown here, to which a further terminal EGEr is, in turn, connected via an ISDN basic access IBA, and where this terminal likewise includes an ISDN card ISC and user programs UPR.

During operation, the ISDN card ISC of a terminal EGE, for example, initiates an outgoing call over the B channel to the hardware platform, where it is expedient to use a "non-dialable" number for this purpose, e.g., "0F10". "Non-dialable" ~~means that~~ refers to the number ~~cannot~~ not being able to be dialed using a conventional keypad, which only has numbers, and is expedient for security reasons. The remote switching center, namely the switching center LVSr on the left of the diagram in this case,

analyzes the dialed number and routes the call through the public exchange to the destination switching center LVSR where the digits in the call number are analyzed, and traffic for the internal hardware platform HWP is identified. The next step is to find a free port for access to the hardware platform HWP, ~~and~~ this ~~is~~ being performed by the routing functions of the switching center LVSR.

As mentioned previously, the ports assigned to the hardware platform HWP are connected within the switching center to the line trunk group LTG for outgoing lines or subscribers. The hardware platform HWP now handles the data transfer protocol with the terminals, and the hardware platform HWP transfers data to the user programs UPR1, UPR2 and UPR3 in the coordination processor COP. Furthermore, the hardware platform HWP accepts data from the user programs and sends them to the terminals EGEr. In this context, the hardware platform HWP is directly connected to the central controller, namely the coordination processor COP, via the bus connection BUV, and uses interprocessor messages to communicate with the user programs. The user programs UPR1, UPR2 and UPR3 in the coordination processor COP receive the data from the hardware platform HWP. If a user program wants to send data back to the terminal EGEr, it uses an interprocessor message to transfer them to the hardware platform, which can dial up terminals directly via a subscriber call number. It is also expedient for the hardware platform HWP to be configured to support data traffic with a terminal via both B channels, in order to allow higher data throughput.

Although the present invention has been described with reference to specific embodiments, those of skill in the art will recognize that changes may be made thereto without departing from the spirit and scope of the invention as set forth in the hereafter appended claims.

~~Abstract~~

ABSTRACT OF THE DISCLOSURE

~~ISDN network with a hardware platform in switching centers~~

An ISDN network with switching centers ~~(VST1, VST2)~~, to which data-compatible terminals ~~(EG1, EG2)~~, e.g. in the form of computers with ISDN cards, are also connected, wherein the switching centers include a switching network ~~(KNE)~~ and a coordination processor ~~(COP)~~ with user programs ~~(UPR)~~, and wherein the network is configured to allow an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs, ~~furthermore~~ and wherein, a hardware platform ~~(HWP)~~ is installed in at least one switching center ~~(VST2)~~ and is assigned a unique call number throughout the network, and a direct bus connection ~~(BUV)~~ is provided between this hardware platform and the coordination processor ~~(COP)~~, where the platform implements the data traffic with the terminals ~~(EG1, EG2)~~ via B channels.

~~Fig. 2~~

Description

ISDN network with a hardware platform in switching centers

The invention relates to an ISDN network with switching centers to which data-compatible terminals, e.g. in the form of computers with ISDN cards, are also connected, wherein the switching centers include a switching network and a coordination processor with user programs, and the network is configured to allow an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs.

Operator systems providing information and/or switching services are typical examples of data exchange between a data-compatible terminal and a digital switching center, where network-wide data connections are to be established between the terminals of operator-console systems and the digital controller of a digital exchange.

According to known proposals, a data connection is established over the ISDN D channel in order to transfer internal data, though network-wide transfer via the network is not possible between port-based user programs. However, the small data volume that can be transferred per time unit, which is theoretically 16 kbit/s for an ISDN D channel (though this transfer rate is only partially achieved), has an adverse effect in practice, since the D channel is also used for ISDN signaling, as a result of which it cannot be used for relatively large data volumes, such as occur for example in the case of software updates requiring several Mbytes.

The object of the invention is to specify a means by which relatively large data volumes can be transferred over data connections between data-

compatible terminals and the

software of the coordination processor in a switching center

Based on an ISDN network of the type described at the beginning, the invention achieves this object by installing a hardware platform in at least one switching center, said hardware platform being assigned a unique call number throughout the network, and a direct bus connection being provided between this hardware platform and the coordination processor, the platform implementing the data traffic with the terminals via B channels.

Using the invention, a data-compatible terminal can dial up the hardware platform directly, so that data from the user programs can be sent to the terminals via the direct bus connection. Since the data traffic now flows via B channels of the ISDN network, it is possible to transfer considerably greater data volumes, i.e. up to 64 kbit/s.

In an advantageous development of the invention, the coordination processor is configured in conjunction with a user program to dial up terminals directly via a subscriber call number. This means that the intelligent digital switching center can also establish a data connection with a data-compatible terminal if necessary.

For transferring relatively large data volumes, it is also expedient to configure the hardware platform to support data traffic with a terminal via both B channels.

For security reasons, it is also possible to assign the hardware platform a call number that cannot be dialed.

The invention and other advantages are described in greater detail below in an exemplary embodiment, and with reference to the drawing, in which:

Figure 1 shows the schematic layout of a switching center with a connected terminal and a state-of-the-art operator console.

Figure 2 schematically shows an ISDN network with two switching centers, together with connected terminals or operator consoles.

According to figure 1, a local switching center LVS has a coordination processor COP, a switching network KNE, and an access unit ASE. A data-compatible terminal EGE may consist of a PC with an ISDN card ISC, for example, and this PC has access to user programs UPR. Using an ISDN basic access IBA, data can be transferred with the switching center LVS over the ISDN D channel. As described in, for example "ISDN - Digitale Netze für Sprachen, Text, Daten, Video und Multimedia-Kommunikation" [ISDN - digital networks for voice, text, data, video and multimedia communication] by Peter Bocker, 4th edition, Springer Verlag 1997, ISBN 3-45-57431-X, each basic access gives a user two 64-kbit/s basic channels, known as B channels, and one 16-kbit/s auxiliary channel, known as the D channel, in each direction. The data stream from a number of ISDN basic accesss, up to approximately 500 in practice, is concentrated in the access units ASE onto a message channel with 64 kbit/s leading to the coordination processor COP, and the data are routed to the individual user programs UPR1, UPR2 and UPR3 from there. Such user programs may be implemented to manage or support a switching operation, for example, where an operator console OPP is provided, e.g. for manual switching. The switching center LVS shown in figure 1 is a local switching center, and provides the only data connection available to the terminal EGE. No network-wide data connections are therefore

possible, in addition to which the data transfer is restricted to 16 kbit/s per terminal. Furthermore, the combination of several ISDN basic accesss on one internal message channel of the switching center LVS creates an undesirable bottleneck.

By contrast, as shown in figure 2, the invention proposes a hardware platform HWP in a switching center LVSR, in addition to the coordination processor COP with the user programs UPR1, UPR2 and UPR3, and a switching network KNE which hardware platform HWP is connected directly to the ports of the line trunk group LTG on one side, and via a direct bus connection BUV to the coordination processor (COP) and its user programs UPR1, UPR2 and UPR3 on the other side. It should be noted that, in principle, a switching center LVSR can be implemented as a what is known as an EWSD (Siemens digital electronic switching system), as described in, for example, "Telekommunikationstechnik" [Telecommunications systems] by Ottfried Georg, in Chapter 7.3 of "Das Vermittlungssystem EWSD" [the EWSD switching system], Springer Verlag 1996, ISBN 3-45-61381-1.

As is evident, the actual ISDN network NET also includes other switching centers, e.g. the switching center LVSr shown on the left of the diagram with a switching network KNE and other equipment not shown here, to which a further terminal EGEr is in turn connected via an ISDN basic access IBA, and where this terminal likewise includes an ISDN card ISC and user programs UPR.

During operation the ISDN card ISC of a terminal EGE, for example, initiates an outgoing call over the B channel to the hardware platform, where it is expedient to use a "non-dialable" number for this purpose, e.g. "0F10". "Non-dialable" means that the number cannot be dialed using a conventional keypad, which only has numbers, and is expedient for security reasons. The remote switching center, namely the

switching center LVSr on the left of the diagram in this case, analyzes the dialed number and routes the

call through the public exchange to the destination switching center LVSR where the digits in the call number are analyzed, and traffic for the internal hardware platform HWP is identified. The next step is to find a free port for access to the hardware platform HWP, and this is performed by the routing functions of the switching center LVSR.

As mentioned previously, the ports assigned to the hardware platform HWP are connected within the switching center to the line trunk group LTG for outgoing lines or subscribers. The hardware platform HWP now handles the data transfer protocol with the terminals, and the hardware platform HWP transfers data to the user programs UPR1, UPR2 and UPR3 in the coordination processor COP. Furthermore, the hardware platform HWP accepts data from the user programs and sends them to the terminals EGEr. In this context, the hardware platform HWP is directly connected to the central controller, namely the coordination processor COP, via the bus connection BUV, and uses interprocessor messages to communicate with the user programs. The user programs UPR1, UPR2 and UPR3 in the coordination processor COP receive the data from the hardware platform HWP. If a user program wants to send data back to the terminal EGEr, it uses an interprocessor message to transfer them to the hardware platform, which can dial up terminals directly via a subscriber call number. It is also expedient for the hardware platform HWP to be configured to support data traffic with a terminal via both B channels, in order to allow higher data throughput.

Patent claims

1. An ISDN network with switching centers (VST1, VST2), to which data-compatible terminals (EG1, EG2), e.g. in the form of computers with ISDN cards, are also connected, wherein the switching centers include a switching network (KNE) and a coordination processor (COP) with user programs (UPR), and wherein the network is configured to allow an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs, characterized in that a hardware platform (HWP) is installed in at least one switching center (VST2) and is assigned a unique call number throughout the network, and a direct bus connection (BUV) is provided between this hardware platform and the coordination processor (COP), where the platform implements the data traffic with the terminals (EG1, EG2) via B channels.

2. The ISDN network as claimed in claim 1, characterized in that the coordination processor (COP) is configured in conjunction with a user program (UPR1, 2, ...) to dial up terminals (EG1, EG2) directly via a subscriber call number.

3. The ISDN network as claimed in claim 1 or 2, characterized in that the hardware platform (HWP) is configured to support data traffic with a terminal (EG1, EG2) via both B channels.

4. The ISDN network as claimed in one of claims 1 to 3, characterized in that the call number assigned to the hardware platform (HWP) is a "non-dialable" call number.

5. The ISDN network as claimed in one of claims 1 to 4, characterized in that the hardware platform (HWP) is directly connected to the ports of a line trunk group (LTG).

Abstract

ISDN network with a hardware platform in switching centers

An ISDN network with switching centers (VST1, VST2), to which data-compatible terminals (EG1, EG2), e.g. in the form of computers with ISDN cards, are also connected, wherein the switching centers include a switching network (KNE) and a coordination processor (COP) with user programs (UPR), and wherein the network is configured to allow an exchange of data between the data-compatible terminals and the coordination processor as defined by the user programs, furthermore, a hardware platform (HWP) is installed in at least one switching center (VST2) and is assigned a unique call number throughout the network, and a direct bus connection (BUV) is provided between this hardware platform and the coordination processor (COP), where the platform implements the data traffic with the terminals (EG1, EG2) via B channels.

Fig. 2

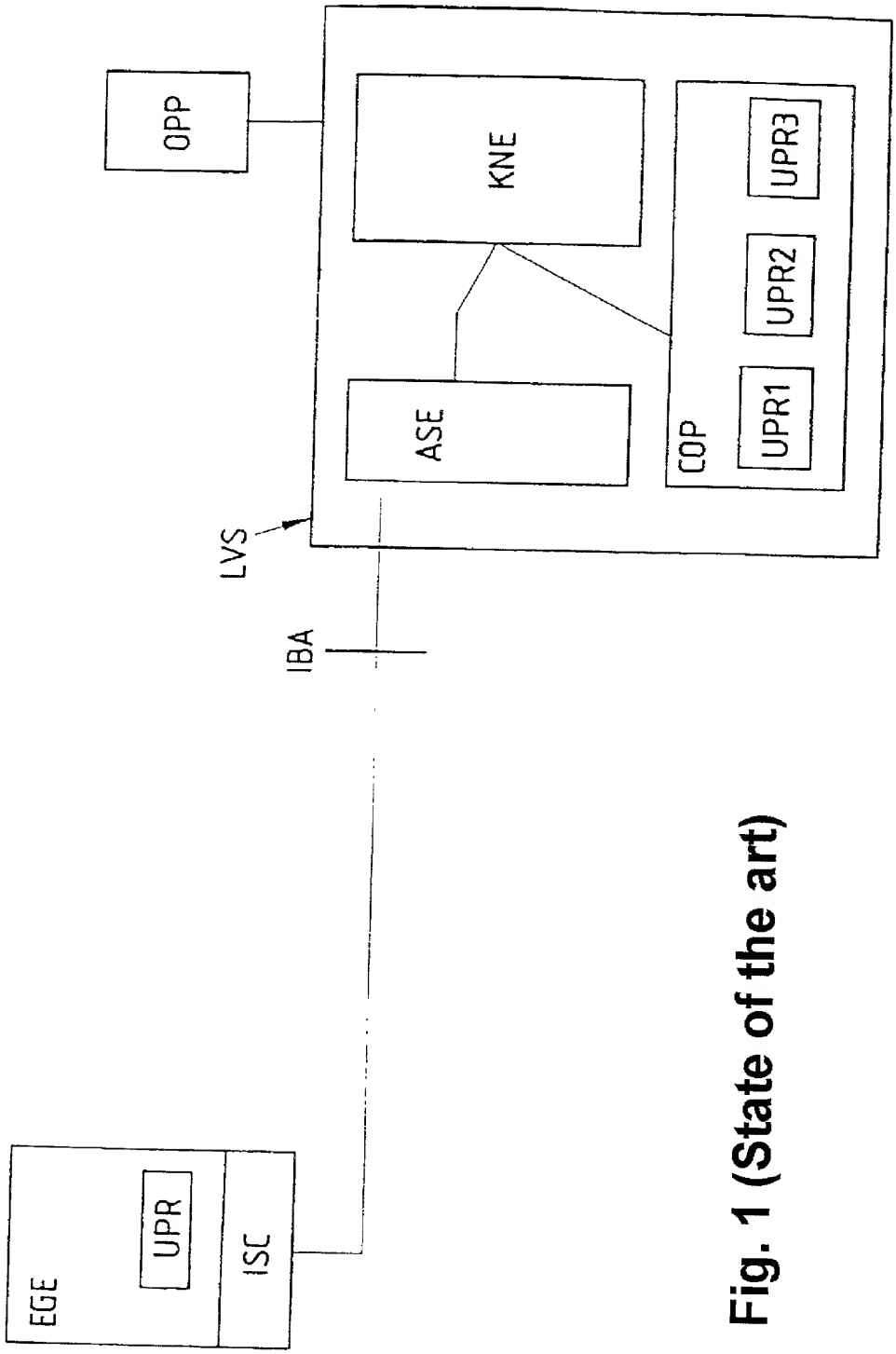

Fig. 1 (State of the art)

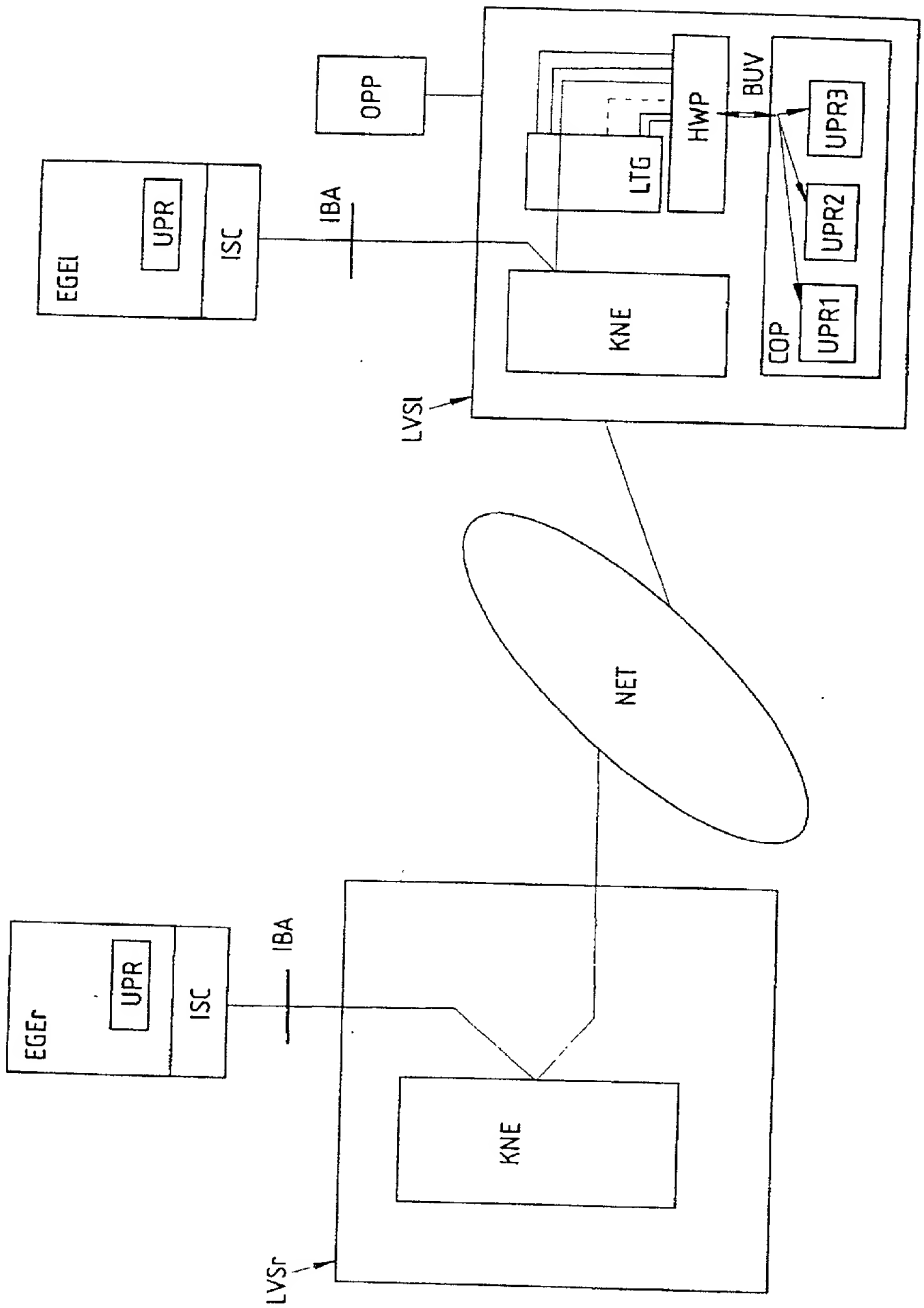
OPP
LTG
HWP
BUV
UPR3
UPR2
UPR1
COP
KNE
EGEl
UPR
ISC
IBA
LVSl
NET
EGEr
UPR
ISC
IBA
KNE
LVSr

Fig.2

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

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My residence, post office address and citizenship are as stated below next to my name,

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I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

ISDN-Netz mit einer Hardware-Plattform in Vermittlungsstellen

ISDN-network with a hardware-platform in switching centres

deren Beschreibung

(zutreffendes ankreuzen)
☐ hier beigefügt ist.
☒ am 15.11.1999 als
PCT internationale Anmeldung
PCT Anmeldungsnummer PCT/DE99/03633
eingereicht wurde und am _____
abgeändert wurde (falls tatsächlich abgeändert).

the specification of which

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Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

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Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign appplications
Priorität beansprucht

			Priority Claimed	
19854419.7	DE	25.11.1998	☒	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

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PCT/DE99/03633	15.11.1999		
(Application Serial No.)	(Filing Date D, M, Y)	(Status)	(Status)
(Anmeldeseriennummer)	(Anmeldedatum T, M, J)	(patentiert, anhängig, aufgegeben)	(patented, pending, abandoned)
(Application Serial No.)	(Filing Date D,M,Y)	(Status)	(Status)
(Anmeldeseriennummer)	(Anmeldedatum T, M; J)	(patentiert, anhängig, aufgeben)	(patented, pending, abandoned)

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German Language Declaration

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Ext. _____

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Telephone: +1 312 372 1121 and Facsimile +1 312 372 2098

or

Customer No.

Voller Name des einzigen oder ursprünglichen Erfinders:	Full name of sole or first inventor:
CHRISTIAN MAIERHOFER	CHRISTIAN MAIERHOFER
Unterschrift des Erfinders: X Christian Maierhofer Datum 7.5.2001	Inventor's signature Date
Wohnsitz	Residence
A-3180 LILIENFELD, ÖSTERREICH	A-3180 LILIENFELD, AUSTRIA
Staatsangehörigkeit AT	Citizenship AT
Postanschrift	Post Office Addess
JUNGHERRNTALSTR. 4	JUNGHERRNTALSTR. 4
A-3180 LILIENFELD	A-3180 LILIENFELD
Voller Name des zweiten Miterfinders (falls zutreffend):	Full name of second joint inventor, if any:
Unterschrift des Erfinders Datum	Second Inventor's signature Date
Wohnsitz ,	Residence ,
Staatsangehörigkeit	Citizenship
Postanschrift	Post Office Address

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

Holby M. Abern (P47,372), Robert M. Barrett (30,142), Alan L. Barry (30,819), Thomas C. Basso (46,541), Jeffrey H. Canfield (38,404), Robert W. Connors (46,639), Amy J. Gast (41,773), James Jagoda (33,250), Patricia A. Kane (46,446), Michael S. Leonard (37,557), Edward A. Lehman (22,312), Adam H. Masia (35,602), Dante J. Picciano (33,543), Renato L. Smith (45,117), Maurice E. Teixeira (45,646), William E. Vaughan (39,056), Austin Victor (47,154), and all members of the firm of Bell, Boyd & Lloyd LLC.

William E. Vaughan
Bell, Boyd & Lloyd LLC
P.O. Box 1135
Chicago, Illinois 60690

William E. Vaughan
312.807.4292